

-continued

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1. An isolated anti-HIV antibody, or antigen-binding portion thereof, comprising a light chain variable region having a light chain amino acid sequence that is at least 75% identical to a polypeptide sequence selected from the group consisting of the light chain variable regions of SEQ ID NOs: 3-13, 22, 24-28, 35-39, 43-45, and 47, wherein the isolated anti-HIV antibody, or antigen-binding portion thereof comprises one or more light chain substitutions at one or more residues selected from the group consisting of LmdV:Y2, LmdV:R7, LmdV:P9, LmdV:E17, LmdV:H46, LmdV:P81.1, LmdV:I81.3, LmdV:N82, LmdV:R88, LmdV:D110, and LmdV:A142.

2. An isolated anti-HIV antibody, or antigen-binding portion thereof, comprising a heavy chain variable region having a heavy chain amino acid sequence that is at least 75% identical to a polypeptide sequence selected from the group consisting of the heavy chain variable regions of SEQ ID NOs: 61-94, wherein the isolated anti-HIV antibody, or antigen-binding portion thereof comprises one or more heavy chain substitutions at one or more residues selected from the group consisting of HV:D29, HV:S47, HV:N75, HV:V79, HV:R82, HV:L89, HV:T108, and HV:K141.

3. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 1, further comprising a heavy chain variable region having a heavy chain amino acid sequence that is at least 75% identical to a polypeptide sequence selected from the group consisting of the heavy chain variable regions of SEQ ID NOs: 61-94, wherein the isolated anti-HIV antibody, or antigen-binding portion thereof comprises one or more heavy chain substitutions at one or more residues selected from the group consisting of HV:D29, HV:S47, HV:N75, HV:V79, HV:R82, HV:L89, HV:T108, and HV:K141.

4. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 1, comprising the one or more light chain substitutions selected from the group consisting of LmdV:Y2P, LmdV:R7P, LmdV:P9S, LmdV:E17Q, LmdV:H46Q, LmdV:P81.1N, LmdV:I81.3S, LmdV:N82G, LmdV:R88T, LmdV:D110E, and LmdV:A142G or conservative substitutions thereof.

5. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 2, comprising the one or more heavy chain substitutions selected from the group consisting of HV:D29G, HV:S47P, HV:N75Q, HV:V79T, HV:R82V, HV:L89F, HV:T108R, and HV:K141Q or conservative substitutions thereof.

6. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 3, comprising the one or more light chain substitutions selected from the group consisting of LmdV:Y2P, LmdV:R7P, LmdV:P9S, LmdV:E17Q, LmdV:H46Q, LmdV:P81.1N, LmdV:I81.3S, LmdV:N82G, LmdV:R88T, LmdV:D110E, and LmdV:A142G or conservative substitutions thereof and the one or more heavy chain substitutions selected from the group consisting of HV:D29G, HV:S47P, HV:N75Q, HV:V79T, HV:R82V, HV:L89F, HV:T108R, and HV:K141Q or conservative substitutions thereof.

7. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 1, wherein the light chain amino acid sequence is at least 75% identical to the light chain variable region of SEQ ID NO.: 3 and comprises a LmdV:Y2P substitution or a conservative substitution of proline at LmdV:Y2.

8. The isolated anti-HIV antibody, or antigen-binding portion thereof, of claim 2, wherein the heavy chain amino acid sequence is at least 75% identical to the heavy chain